



511 Parking Web Services

API Reference

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Section 1: Introduction

Purpose

This document outlines the design and usage of the 511 Parking Web Services Application Programming Interface (API). This document contains the following sections:

- **Introduction** – an overview of this document including background about the 511 service, overview of the API, a description of the intended audience, and contact information.
- **Technical Overview** – a high-level discussion of the technical implementation of the API.
- **Service Definitions** – a detailed list of the service definitions for the Parking API.
- **Usage Scenario** – a simple scenario-based example of how to implement and use the API.
- **Appendix - API Errors** – a list of errors that can be incurred upon execution of any of the services.

511 Background

511 is the San Francisco Bay Area's free traveler information service available on the phone by calling 511 and on the web at 511.org. The 511 service provides travelers with easy access to current and accurate traffic, transit, rideshare, bicycling, and parking information. The Metropolitan Transportation Commission (MTC) operates the 511 service in partnership with the California Department of Transportation (Caltrans) District 4, the California Highway Patrol Golden Gate Division (CHP), and Bay Area transit agencies. MTC contracts with a third-party contractor ("511 Contractor") to provide the 511 service.

511 Parking API Overview

The 511 Parking API is one of several different data feeds MTC makes available free-of-charge to the general public, media, public agencies, and commercial vendors to the extent feasible within the available funding. The 511 Contractor gathers and integrates information from a variety of sources, including (1) real-time data on parking conditions (availability and price) as well as facility data (location, hours, phone number) for 14 garages and one lot in San Francisco as collected by sensors operated by SFpark; (2) real-time data on parking conditions (availability and price) as well as location data for 7000 on-street parking spaces in San Francisco divided into zones as collected by sensors operated by SFpark; and (3) facility data (location, hours of operation, number of spaces) for parking at or near transit stations as well as Park & Ride lots throughout the nine-county Bay Area. This API provides access to 511's real-time parking and facility data for application development. The API allows developers to create applications and tools that provide 511 Parking information based on user-selected requests.

Audience

This document is intended for developers wishing to utilize the 511 Parking API from within their web sites and applications. It is assumed that the reader has a firm grasp of their development tools and technologies and has had some experience with web service technologies including XML. Additionally, some familiarity with security and encryption technologies may be helpful.

Contact Information

For questions concerning the 511 Parking API or if you create an app or tool from this data and want to showcase it on 511.org, please e-mail: developerresources@511.org. You may also wish to join 511's Google Group, [511SFBayDeveloperResources](#). The group allows developers to reach out to MTC and each other with questions and feedback about 511 data, applications, APIs, etc., and enables developers to share ideas with MTC about potential improvements.

Section 2: Technical Overview

The 511 Parking Data Services are a collection of individual services, each providing a specific capability related to parking availability information inquiry within the 511 system. Each service is implemented using simple web pages that accept query string parameters and return plain XML documents (referred to hereafter as “POX” for “Plain Old XML”).

A valid security token identifier is required to make requests to these services and must be supplied with each request. Section 3 provides a detailed overview on how to access these services. The token can be obtained at http://511.org/developer-resources_api-security-token.asp. The services address common needs within the 511 system associated with parking availability and facility data management. The following table lists the service catalog items along with relevant information for each service:

Table 1 - List of 511 Driving Times Data Services

Service Name	Category	EndPoint	Description
GetCities	Parking	services.my511.org/parking/GetCities.aspx	Retrieves a list of cities served by the system.
GetNeighborhoods	Parking	services.my511.org/traffic/GetNeighborhoods.aspx	Retrieves a list of neighborhoods in a given city.
GeParkingZones	Parking	services.my511.org/traffic/GeParkingZones.aspx	Retrieves a list of parking zones (IDs and names) for a particular area.
GetParkingFacilities	Parking	services.my511.org/traffic/GetParkingFacilities.aspx	Retrieves a list of parking facilities (IDs) for a particular area.
GetParkingFacilityInfo	Parking	services.my511.org/traffic/GetParkingFacilities.aspx	Retrieves all information about a specific parking facility, including location, contact info, parking facility type, neighborhood, pricing, hours of operation, current and total availability).

Section 3: Service Definitions – Parking

Service Name: GetCities

Comments & Usage:

GetCities returns the list of cities served by this system.

To return the cities list, go to the service URL, using a currently valid security token as the token parameter. XML will be returned as noted in the example below, providing the cities list. A city will have the dynamicDataFeedFailing attribute set to true if there is a problem with the dynamic data feed for the city.

Service URL:

<http://services.my511.org/parkingwebservices/GetCities.aspx>

Schema Location:

<http://services.my511.org/parkingwebservices/schemas/ParkingAPI.xsd>

Query Parameters:

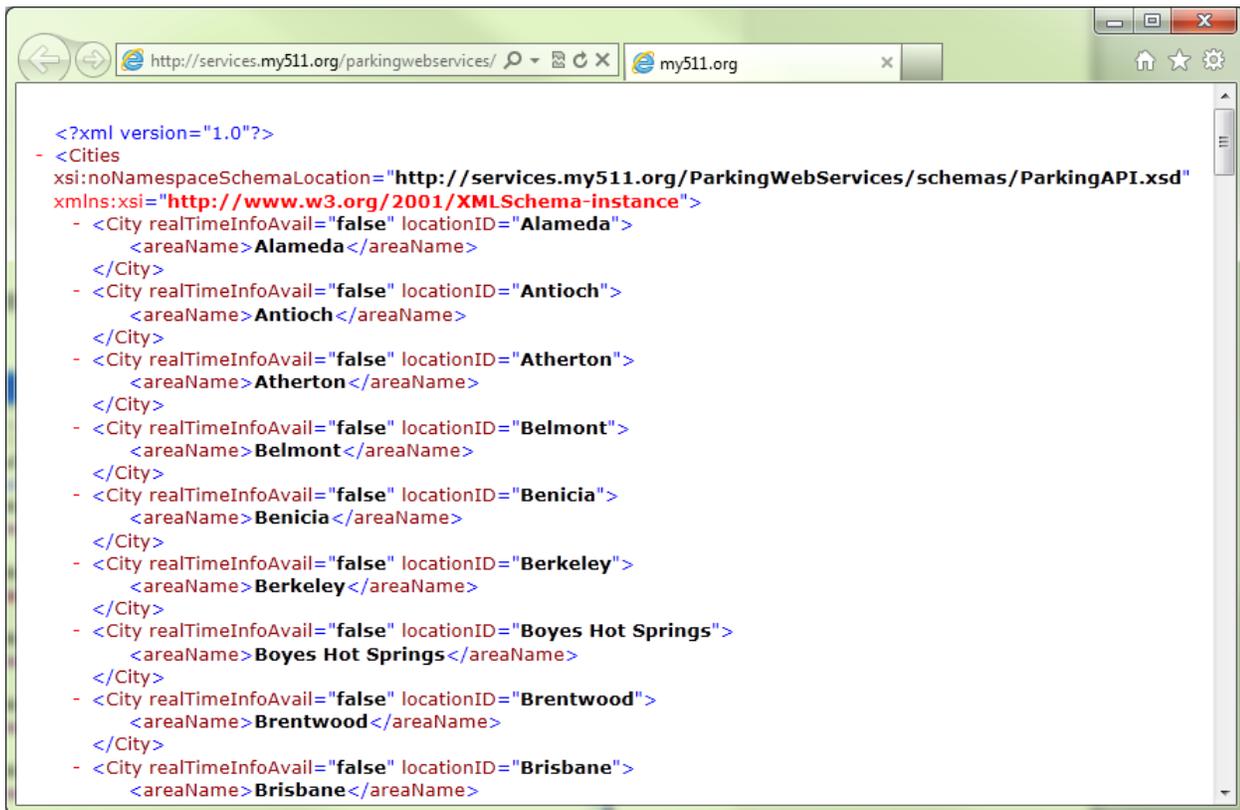
- token – the valid security token used for making service calls

Example Usage:

<http://services.my511.org/parkingwebservices/GetCities.aspx?token=123>

Returns: List of cities.

Example XML Returned:



```
<?xml version="1.0"?>
- <Cities
xsi:noNamespaceSchemaLocation="http://services.my511.org/ParkingWebServices/schemas/ParkingAPI.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  - <City realTimeInfoAvail="false" locationID="Alameda">
    <areaName>Alameda</areaName>
  </City>
  - <City realTimeInfoAvail="false" locationID="Antioch">
    <areaName>Antioch</areaName>
  </City>
  - <City realTimeInfoAvail="false" locationID="Atherton">
    <areaName>Atherton</areaName>
  </City>
  - <City realTimeInfoAvail="false" locationID="Belmont">
    <areaName>Belmont</areaName>
  </City>
  - <City realTimeInfoAvail="false" locationID="Benicia">
    <areaName>Benicia</areaName>
  </City>
  - <City realTimeInfoAvail="false" locationID="Berkeley">
    <areaName>Berkeley</areaName>
  </City>
  - <City realTimeInfoAvail="false" locationID="Boyes Hot Springs">
    <areaName>Boyes Hot Springs</areaName>
  </City>
  - <City realTimeInfoAvail="false" locationID="Brentwood">
    <areaName>Brentwood</areaName>
  </City>
  - <City realTimeInfoAvail="false" locationID="Brisbane">
    <areaName>Brisbane</areaName>
  </City>
</Cities>
```

Exceptions & Errors:

Required Parameter Missing

Indicates a required parameter was not provided in the Parking Web Service request.

Valid Token Required

Indicates there was a problem validating the token. A registered token must be provided with each Parking Web Service request.

Unexpected Error

Indicates the web service encountered an unexpected problem and is not able to fulfill the request at the present time.

Service Name: GetNeighborhoods

Comments & Usage:

GetNeighborhoods returns a list of neighborhoods in a given city.

To return the neighborhoods list, go to the service URL, using a currently valid security token and a city derived from the GetCities list as the token parameters. XML will be returned as noted in the example below, providing the neighborhoods list for the city provided.

Service URL:

<http://services.my511.org/parkingwebservices/GetNeighborhoods.aspx>

Schema Location:

<http://services.my511.org/parkingwebservice/schemas/ParkingAPI.xsd>

Query Parameters:

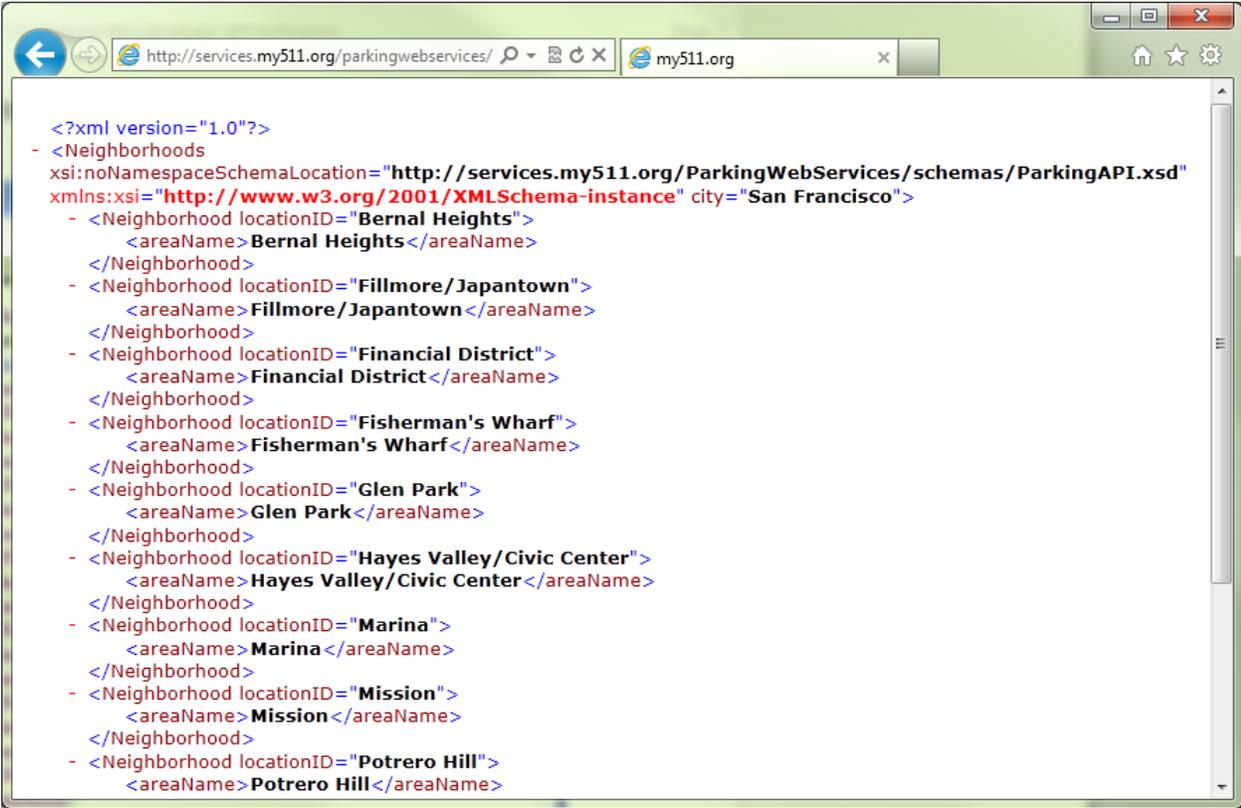
- City – the name of a city from the GetCities list.
- Token – the valid security token used for making service calls

Example Usage:

<http://services.my511.org/parkingwebservice/GetNeighborhoods.aspx?token=123&city=San Francisco>

Returns: List of neighborhoods.

Example XML Returned:



The screenshot shows a web browser window with the address bar containing the URL: <http://services.my511.org/parkingwebservice/>. The browser tab is labeled "my511.org". The main content area displays the following XML response:

```
<?xml version="1.0"?>
- <Neighborhoods
  xsi:noNamespaceSchemaLocation="http://services.my511.org/ParkingWebServices/schemas/ParkingAPI.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" city="San Francisco">
  - <Neighborhood locationID="Bernal Heights">
    <areaName>Bernal Heights</areaName>
  </Neighborhood>
  - <Neighborhood locationID="Fillmore/Japantown">
    <areaName>Fillmore/Japantown</areaName>
  </Neighborhood>
  - <Neighborhood locationID="Financial District">
    <areaName>Financial District</areaName>
  </Neighborhood>
  - <Neighborhood locationID="Fisherman's Wharf">
    <areaName>Fisherman's Wharf</areaName>
  </Neighborhood>
  - <Neighborhood locationID="Glen Park">
    <areaName>Glen Park</areaName>
  </Neighborhood>
  - <Neighborhood locationID="Hayes Valley/Civic Center">
    <areaName>Hayes Valley/Civic Center</areaName>
  </Neighborhood>
  - <Neighborhood locationID="Marina">
    <areaName>Marina</areaName>
  </Neighborhood>
  - <Neighborhood locationID="Mission">
    <areaName>Mission</areaName>
  </Neighborhood>
  - <Neighborhood locationID="Potrero Hill">
    <areaName>Potrero Hill</areaName>
  </Neighborhood>
</Neighborhoods>
```

Exceptions & Errors:

Required Parameter Missing

Indicates a required parameter was not provided in the Parking Web Service request.

Valid Token Required

Indicates there was a problem validating the token. A registered token must be provided with each Parking Web Service request.

Unexpected Error

Indicates the web service encountered an unexpected problem and is not able to fulfill the request at the present time.

Service Name: GetParkingZones

Comments & Usage:

GetParkingZones returns a list of parking zones for a particular area. The area can be defined in two ways:

1. A particular city or city + neighborhood
2. A square area specified by Latitude, Longitude, and Radius in miles.

In addition, a specific parking zone can be requested by its zone ID.

To return the parking zones list, go to the service URL, using a currently valid security token and selected query parameters, shown below, as the token parameters. XML will be returned as noted in the example below, providing the zones for the given parameters.

Service URL:

<http://services.my511.org/parkingwebservices/GetParkingZones.aspx>

Schema Location:

<http://services.my511.org/parkingwebservices/schemas/ParkingAPI.xsd>

Query Parameters:

- City – the name of a city from the GetCities list.
- Neighborhood (optional) – the name of a neighborhood from the GetNeighborhoods list.
- Latitude – the latitudinal coordinate. If specified, longitude is also required.
- Longitude – the longitudinal coordinate. If specified, latitude is also required.
- Radius – the square radius in miles. Only applies when using Latitude and Longitude. Defaults to one mile.
- Token – the valid security token used for making service calls

Example Usages:

Request parking zones by city & neighborhood:

<http://services.my511.org/parkingwebservices/GetParkingZones.aspx?City=San Francisco&Neighborhood=SOMA&Token=123-456-789>

Request parking zones by coordinates & radius:

<http://services.my511.org/parkingwebservices/GetParkingZones.aspx?Latitude=3779&Longitude=-12243&Radius=3.5&Token=123-456-789>

Request parking zone by Zone ID:

<http://services.my511.org/parkingwebservices/GetParkingZones.aspx?token=123-456-789&zoneid=53>

Returns: List of Parking Zones.

Example XML Returned:



The screenshot shows a web browser window with the URL <http://services.my511.org/parkingwebservices/>. The browser displays XML data for parking zones in San Francisco. The XML is as follows:

```
<?xml version="1.0"?>
- <ParkingZones
  xsi:noNamespaceSchemaLocation="http://services.my511.org/ParkingWebServices/schemas/ParkingAPI.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" city="San Francisco" neighborhood="SoMa">
  - <ParkingZone locationID="96">
    <areaName>3rd & Brannan</areaName>
  </ParkingZone>
  - <ParkingZone locationID="97">
    <areaName>Beale & Embarcadero</areaName>
  </ParkingZone>
  - <ParkingZone locationID="98">
    <areaName>1st & Folsom</areaName>
  </ParkingZone>
  - <ParkingZone locationID="99">
    <areaName>Spear & Folsom</areaName>
  </ParkingZone>
  - <ParkingZone locationID="100">
    <areaName>3rd & Folsom</areaName>
  </ParkingZone>
  - <ParkingZone locationID="101">
    <areaName>New Montgomery & Mission</areaName>
  </ParkingZone>
  - <ParkingZone locationID="102">
    <areaName>1st & Mission</areaName>
  </ParkingZone>
  - <ParkingZone locationID="103">
    <areaName>Main & Mission</areaName>
  </ParkingZone>
  - <ParkingZone locationID="106">
    <areaName>Spear St & Mission St</areaName>
```

Exceptions & Errors:

Required Parameter Missing

Indicates a required parameter was not provided in the Parking Web Service request.

Valid Token Required

Indicates there was a problem validating the token. A registered token must be provided with each Parking Web Service request.

Unexpected Error

Indicates the web service encountered an unexpected problem and is not able to fulfill the request at the present time.

Comments & Usage:

GetParkingFacilities returns a list of Parking Facilities (IDs or list that includes all details for the facilities for a particular area. The area can be defined in multiple ways:

1. A particular city, city + neighborhood, or city + neighborhood + parking zone.
2. A square area specified by Latitude, Longitude, and Radius in miles.

By default, a list of Parking Facility ID's will be returned. Alternately, all Facility Information (location, contact info, parking facility type, neighborhood, pricing, hours of operation, current and total availability) can also be requested.

Facility Listings can be filtered by excluded Parking Types.

Table 2 – Excludable Parking Types ParkingTypeID	Parking Type
1	Open lot
2	Garage
3	Permit
4	Contract
5	Free
6	Pay
7	On-street

To return the parking facilities list, go to the service URL, using a currently valid security token and selected query parameters, shown below, as the token parameters. XML will be returned as noted in the example below, providing the facilities for the given parameters.

A facility will have the dynamicDataFeedFailing entry set to true in the tail section of the XML if there is a failure with the dynamic data feed for the facility.

Service URL:

<http://services.my511.org/parkingwebservices/GetParkingFacilities.aspx>

Schema Location:

<http://services.my511.org/parkingwebservices/schemas/ParkingAPI.xsd>

Query Parameters:

- Details (optional) – “full” or “ID”. Defaults to “ID”
- excludeParkingTypes (optional) – a comma delimited list of “Parking Type” identifiers to exclude from the result, shown in Table 2 above.
- City – the name of a city from the GetCities list.

- Neighborhood (optional) – the name of a neighborhood from the GetNeighborhoods list. City must be specified.
- Latitude – the latitudinal coordinate. If specified, Longitude is also required.
- Longitude – the longitudinal coordinate. If specified, Latitude is also required.
- Radius – the square radius in miles. Only applies when using Latitude and Longitude. Defaults to one mile.
- Token – the valid security token used for making service calls

Example Usages:

Get a list of ID's of all Parking Facilities in Fillmore, San Francisco:

<http://services.my511.org/parkingwebservices/GetParkingFacilities.aspx?token=123&City=SanFrancisco&Neighborhood=Fillmore>

Get a list of ID's of all Parking Facilities in a 3.5 mile radius of lat 37.79, long -122.43:

<http://services.my511.org/parkingwebservices/GetParkingFacilities.aspx?Latitude=3779&Longitude=-12243&Radius=3.5&Token=123-456-789>

Get all Parking Facilities except garages and on-street parking in Downtown San Francisco:

<http://services.my511.org/parkingwebservices/GetParkingFacilities.aspx?token=123&City=SanFrancisco&neighborhood=Downtown&details=full&excludeParkingTypes=2,7>

Returns: List of Parking Facilities or Facility ID's.

Example XML Returned (ID's only):

```

<?xml version="1.0"?>
- <ParkingFacilitiesIDs
xsi:noNamespaceSchemaLocation="http://services.my511.org/ParkingWebServices/schemas/ParkingAPI.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" city="San Francisco">
  <ParkingFacilityGlobalID>1200:608012</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:413221</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:216291</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:205062</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:826061</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:463002</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:608022</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:470001</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:568011</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:644032</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:415321</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:826062</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:415311</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:471061</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:339011</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:864041</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:463011</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:415322</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:470002</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:415312</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:204051</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:370011</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:658021</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:658041</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:339012</ParkingFacilityGlobalID>
  <ParkingFacilityGlobalID>1200:205061</ParkingFacilityGlobalID>

```

Example XML returned (all details):

```

<?xml version="1.0"?>
- <ParkingFacilitiesDetails
xsi:noNamespaceSchemaLocation="http://services.my511.org/ParkingWebServices/schemas/ParkingAPI.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" city="San Francisco">
  - <ParkingFacilityDetails globalID="1200:608012">
    - <FacilityInfo>
      - <static>
        <parkingFacID>608012</parkingFacID>
      - <location>
        - <grid>
          - <gridArray>
            - <gridArray-item>
              <id>1</id>
              <latitude>377986</latitude>
              <longitude>-1224353</longitude>
              <zoom>1</zoom>
            </gridArray-item>
            - <gridArray-item>
              <id>2</id>
              <latitude>377985</latitude>
              <longitude>-1224356</longitude>
              <zoom>1</zoom>
            </gridArray-item>
          </gridArray>
        </grid>
      </location>
      <parkingType>7</parkingType>
    - <lotDetail>
      <city>San Francisco</city>
      <neighborhood>Marina</neighborhood>

```

Exceptions & Errors:

Required Parameter Missing

Indicates a required parameter was not provided in the Parking Web Service request.

Valid Token Required

Indicates there was a problem validating the token. A registered token must be provided with each Parking Web Service request.

Unexpected Error

Indicates the web service encountered an unexpected problem and is not able to fulfill the request at the present time.

Service Name: GetParkingFacilityInfo

Comments & Usage:

GetParkingFacilityInfo returns all info about a specific Parking Facility, including location, contact info, parking facility type, neighborhood, pricing, hours of operation, current and total availability. .

To return the parking facilities info list, go to the service URL, using a currently valid security token and parking facility ID as the token parameters. XML will be returned as noted in the example below, providing the detailed facility information for the given parameters.

Service URL:

<http://services.my511.org/parkingwebservices/GetParkingFacilityInfo.aspx>

Schema Location:

<http://services.my511.org/parkingwebservices/schemas/ParkingAPI.xsd>

Query Parameters:

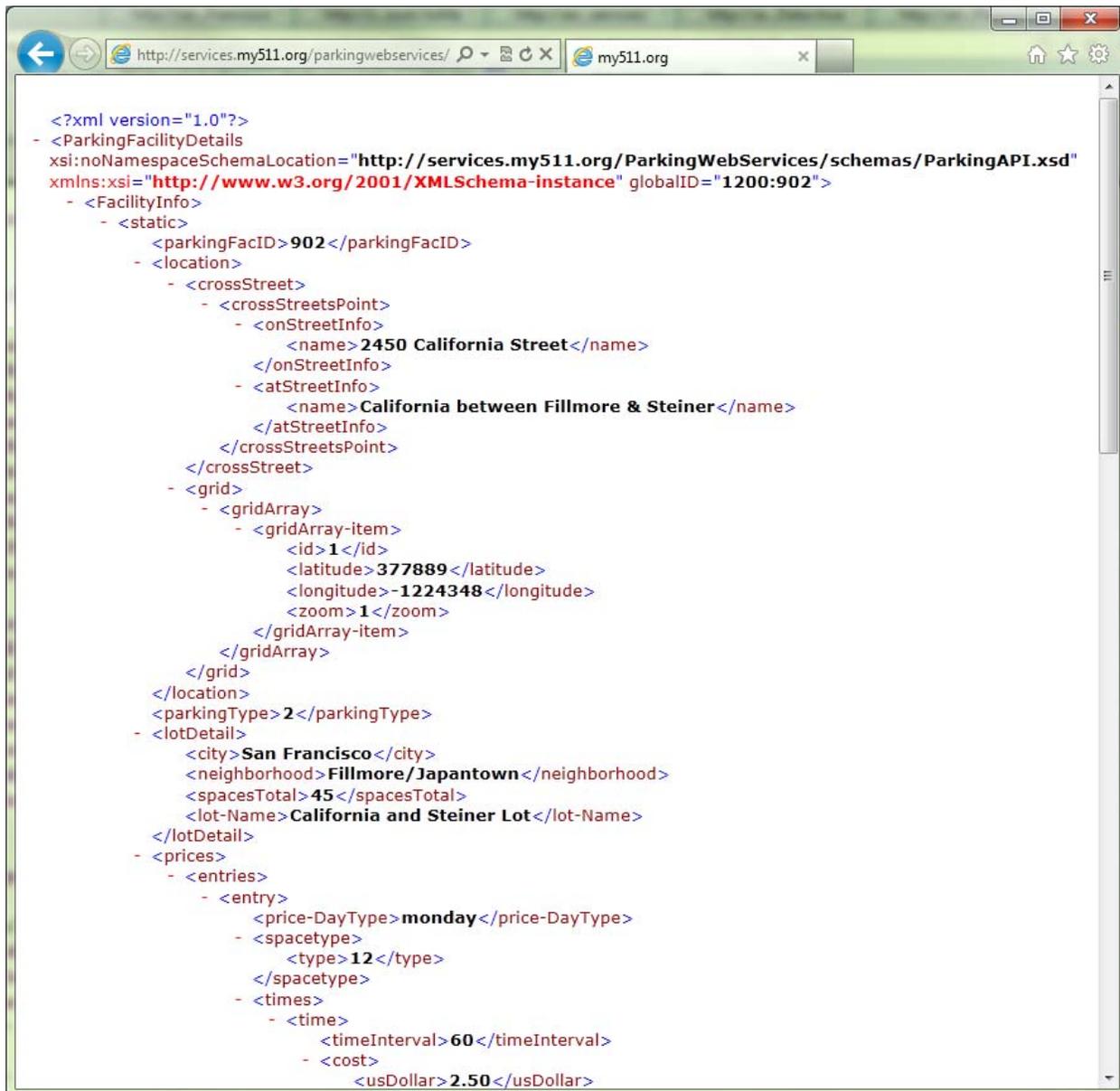
- ParkingFacilityID – the Global ID of the Parking Facility.
- Token – the valid security token used for making service calls

Example Usage:

<http://services.my511.org/parkingwebservices/GetParkingFacilityInfo.aspx?token=123&ParkingFacilityID=1200:902>

Returns: Detailed Parking Facility Information, including location, contact info, parking facility type, neighborhood, pricing, hours of operation, current and total availability.

Example XML Returned:



```
<?xml version="1.0"?>
- <ParkingFacilityDetails
xsi:noNamespaceSchemaLocation="http://services.my511.org/ParkingWebServices/schemas/ParkingAPI.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" globalID="1200:902">
  - <FacilityInfo>
    - <static>
      <parkingFacID>902</parkingFacID>
    - <location>
      - <crossStreet>
        - <crossStreetsPoint>
          - <onStreetInfo>
            <name>2450 California Street</name>
          </onStreetInfo>
          - <atStreetInfo>
            <name>California between Fillmore & Steiner</name>
          </atStreetInfo>
        </crossStreetsPoint>
      </crossStreet>
    - <grid>
      - <gridArray>
        - <gridArray-item>
          <id>1</id>
          <latitude>377889</latitude>
          <longitude>-1224348</longitude>
          <zoom>1</zoom>
        </gridArray-item>
      </gridArray>
    </grid>
  </location>
  <parkingType>2</parkingType>
  - <lotDetail>
    <city>San Francisco</city>
    <neighborhood>Fillmore/Japantown</neighborhood>
    <spacesTotal>45</spacesTotal>
    <lot-Name>California and Steiner Lot</lot-Name>
  </lotDetail>
  - <prices>
    - <entries>
      - <entry>
        <price-DayType>monday</price-DayType>
        - <spacetype>
          <type>12</type>
        </spacetype>
        - <times>
          - <time>
            <timeInterval>60</timeInterval>
            - <cost>
              <usDollar>2.50</usDollar>
            </cost>
          </time>
        </times>
      </entry>
    </entries>
  </prices>
</ParkingFacilityDetails>
```

Exceptions & Errors:

Required Parameter Missing

Indicates a required parameter was not provided in the Parking Web Service request.

Valid Token Required

Indicates there was a problem validating the token. A registered token must be provided with each Parking Web Service request.

Unexpected Error

Indicates the web service encountered an unexpected problem and is not able to fulfill the request at the present time.

Section 4: Usage Scenario

This section provides a usage scenario for retrieving parking availability data with the services. This scenario is not intended to provide guidance on application development topics such as programming language, selection, or application logic. Instead, it is intended to present the service ordering which is required to achieve the desired end data result.

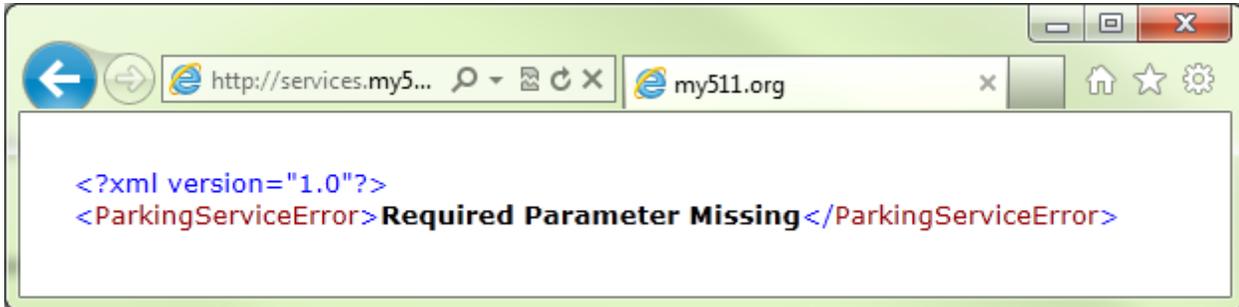
Parking Availability Scenario

1. Retrieve the cities list using the GetCities service, passing in your valid security token as the “token” parameter.
2. Present the resulting cities to the user.
3. Retrieve the neighborhoods list using the GetNeighborhoods service, passing in your valid security token as the “token” parameter and user-selected city.
4. Present the resulting neighborhoods (if any, not all cities have them) to the user.
5. Retrieve the parking zones list (IDs and names) using the GetParkingZones service, passing in your valid security token as the “token” parameter and user-selected city and neighborhood.
6. Present the resulting parking zones’ names (if any, not all cities have them) to the user.
7. Retrieve the parking facilities list using the GetParkingFacilities service, passing in your valid security token as the “token” parameter and user-selected city, neighborhood, parking zone.
8. Present the resulting parking facilities to the user.
9. Retrieve the parking facility information (details) using the GetParkingFacilityInfo service, passing in your valid security token as the “token” parameter and user-selected facility ID.
10. Present the parking facility information, including current availability, pricing, hours of operation, to the user in a suitable format.

Appendix 1 – API Errors

Listed here are all the possible errors that can occur upon execution of any of the Parking Web Services. When an error occurs, the error message will be returned in XML format in a “ParkingServiceError” root node.

Example Error Message:



Required Parameter Missing

Indicates a required parameter was not provided in the Parking Web Service request.

Valid Token Required

Indicates there was a problem validating the token. A registered token must be provided with each Parking Web Service request.

Unexpected Error

Indicates the web service encountered an unexpected problem and is not able to fulfill the request at the present time.

XML Failed Validation

Indicates the returned XML did not pass a validation test. This error message will only be returned if validation is specifically requested by including the query parameter “val=true” in the Parking Web Service request.